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10/596,052	05/26/2006	**Tokunori Kimura**	2382-54	1195

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RASHID, DAVID	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,052	KIMURA, TOKUNORI	
	Examiner	Art Unit	
	DAVID P. RASHID	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16-29,37,38,41 and 42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16-29,37,38,41 and 42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Table of Contents

Amendment & Claim Status

[1] This Detailed Action is responsive to Amendment Under 37 C.F.R. § 1.111 ("Amendment") received Jun. 11, 2010. Claims 1-14, 16-29, 37, 38, 41, and 42 remain pending; Claims 15, 30-36, 39, 40, 43, and 44 cancelled.

Information Disclosure Statement

[2] Applicant requests Examiner to review and correct appropriate USPTO records so as to properly indicate that it has already been duly filed and received at the USPTO. Applicant traverses Examiner's indication that the Jun. 3, 2008 IDS does not contain an attachment of the therein identified Chinese office action papers. Amendment at 15.

As of the Office Action sent Jan. 13, 2010, the IDS filed Dec. 22, 2008 failed to comply with the provisions of 37 C.F.R. §§ 1.97, 1.98 and MPEP § 609 because "each information disclosure statement must also include a legible copy of:. . .(B) Each publication or that portion which caused it to be listed. . .(D) All other information or that portion which caused it to be listed". MPEP § 609.04(a)(II). The Examiner cannot find the appropriate USPTO records so as to properly indicate that the priority document listed in the IDS filed Dec. 22, 2008 has already

been duly filed and received at the USPTO. The Examiner finds both the IDS (listing the CN Office Action under the "Other Documents" section) and IDS transmittal letter (stating an attached CN Office Action "in a counterpart of this application. . .") filed Jun. 3, 2008, but no "legible copy" for the CN Office Action.

However, in response to the CN certified priority document filed Jun. 11, 2010, the information disclosure statement filed Dec. 22, 2008 complies with the provisions of 37 C.F.R. § 1.97, 1.98 and M.P.E.P. § 609. It has been placed in the application file, and the information referred to therein has been considered as to the merits.

Specification

[3] The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. It is suggested to change to "MAGNETIC RESONANCE IMAGING AND CORRECTING DEVICE~~, IMAGE DATA CORRECTING DEVICE AND IMAGE DATA CORRECTING METHOD~~"

Claim Objections

[4] In response to Amendment at 16, the previous claim objections are withdrawn.

Claim Rejections - 35 U.S.C. § 112

[5] In response to Amendment at 16, the previous § 112 rejections are withdrawn.

[6] The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-14, 16-29, 37, 38, 41, and **42** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The written description does not provide adequate information in such a way as to reasonably convey to one skilled in the relevant art a "pulse series based on. . .[both] a spiral method and a radial method". Claim 1, lines 12-13. The claimed (i) spiral and (ii) radial methods are not adequately disclosed within the written description. It is suggested to change to "a pulse series based on ~~one of~~ a spin warp method~~, a spiral method, and a radial method~~ in a pulse series of one of a multi-shot type and a single type is arranged".

[7] The following is a quotation of the second paragraph of 35 U.S.C. § 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8, 18, 21, 25 and **26** are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8, line 9 and Claim 18, line 3, "supposed in advance" is unclear from the specification what definite degree is supposing in advance (whether measuring a model, or a mental activity).

Claim 21, line 4, "said abdominal wall side"; and line 5, "said back side" lacks clear antecedent basis.

Claim 25, line 2, "the abdominal part"; line 3, "the back side"; and lines 3-4 "the abdominal wall side" lacks clear antecedent basis. Claim 26 by analogy.

Claim Rejections - 35 U.S.C. § 101

Software Apparatus Claims

[8] The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows (see also § MPEP 2106):

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and

> Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims 1-14, 16-29, 41 and **42** are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. While the claim preamble recites an "image data correcting device", the body of the claim presents a series of steps or actions, and lacks corresponding structure for accomplishing those steps or actions. *See, e.g.,* Specification at ¶0039 (indicating "an unillustrated stored software procedure, and generalizing the operation of the entire device"). Claims 1-14, 16-29, 41 and 42 are drawn to functional descriptive material, but functional descriptive material alone does not solely fall within a statutory category. See MPEP § 2106.01. Therefore, given the lack of claimed structure, the full scope of the claim when properly read in light of the disclosure appears encompass software per se, which does not fall within a statutory category.

Bilski – Abstract Idea Test

[9] **Claims 37** and **38** are rejected under 35 U.S.C. § 101 as not falling within one of the four statutory categories of invention.

In view of Supreme Court precedent[1] and recent opinion in *Bilski*[2], process/method claims ("method-claims") under § 101 are patent-eligible so long as it is not disqualified as one of the exceptions to § 101 (i.e., laws of nature, physical phenomena, and abstract idea). The USPTO has recently provided guidance to determine whether the method-claim, viewed as a

[1] See *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); and *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).
[2] *Bilski v. Kappos*, 561 U.S. ___ (2010).

whole, is disqualified as an abstract idea.[3] Factors for determining whether a method-claim is drawn to an abstract idea, *as a whole*, include whether the method-claim is (i) tied to a particular machine or apparatus; (ii) transforms underlying subject matter (such as an article or material) to a different state or thing; (iii); involves an application of a law of nature; and (iv) a general concept (e.g., mathematical concept, mental activity, principle, theory) involved in executing the method-steps.[4] In addition, extrasolution activity (whether pre- or post-) or field-of-use involvement in favor of patent-eligible subject matter (e.g., involving a particular machine or article transformation) for the method-claim, as a whole, must impose meaningful limits on the execution of the claimed method-steps.[5]

The concept of Claims 37 and 38, i.e., making a correction different from that of a second area in a first area of image data of a body by a scan of MRI, is not tied to a particular machine and does not transform an underlying article, and thus remains solely a concept. In addition, acquiring movement information and using "a scan of magnetic resonance imaging" (i) may be strictly image-analysis (i.e., mathematical computation of an image signal); or (ii) is pre-solution activity (i.e., if the body is physical). The method-steps that do impose meaningful limits do not require a particular machine or transform an underlying article. The concept from Claims 37 and 38 remains an unpatentable abstract idea. Allowing Applicant(s) to patent the concept would preempt use of this approach in all fields, and would grant a monopoly over the abstract idea.[6]

It is suggested to tie a particular machine (e.g., a "computer processor" if supported in the specification, not "machine") to a meaningful limit on the claim's scope (e.g., the correction method-step of Claims 37 and 38).

Claim Rejections - 35 U.S.C. § 103

[10] The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

---

[3] See *Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of Bilski v. Kappos*, Federal Register, Vol. 75, No. 143, pp. 43922-43928, Jul. 27, 2010 (available at http://www.uspto.gov/patents/law/notices/75fr36357.pdf).
[4] *Id.*
[5] *Id.*
[6] See *Bilski* at 15.

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

[11] This application currently names joint inventors. In considering patentability of the claims under § 103(a), the examiner presumes that the subject matter of the various Claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. § 103(c) and potential § 102(e), (f) or (g) prior art under § 103(a).

[12] The factual inquiries set forth in *Graham*[7], that are applied for establishing a background for determining obviousness under § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Takizawa in view of Edelstein

[13] **Claims 1-5, 7, 9, 11-18, 20, 24, 27-29, 37, 38, 41** and **42** are rejected under § 103(a) as being unpatentable over *Takizawa et al.*, J.P. 2000-157507 ("Takizawa") in view of *Edelstein et al.*, Spin-Warp NMR Imaging and Applications to Human Whole-Body Imaging, Physics in Medicine and Biology, Vol. 25, pp. 751-756, 1980 ("Edelstein").

Regarding **Claim 1**, while Takizawa discloses an image data correcting device (fig. 1) comprising:

a movement information acquiring section (fig. 1, item 406) for acquiring movement information ("[t]he signal which each small RF coil of multiple coils received is detected" at ¶ 0014) showing a spatial distribution (e.g., fig. 8, spatial distribution items 1011, 1021, 1022) of

[7] *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966).

the magnitude of a movement in the real space of an image pickup part (fig. 1, item 405; fig. 8) of a detected body (fig. 8, item 1011 and the four smaller circles contained within item 1011);

a correcting section (fig. 1, item 407) for making a correction different (fig. 8, items 1022 and 1023 are different) from that of a second area (fig. 8, top-right inner circle within item 1011) in a first area (fig. 8, bottom-right inner circle within item 1011) of image data of the image pickup part (fig. 1, item 405; fig. 8) of said detected body (fig. 8, item 1011 and the four smaller circles contained within item 1011) collected by a scan of magnetic resonance imaging (fig. 1) on the basis of said movement information ("signal processing part 407 has the body motion compensation means using the navigation echo" at ¶ 0015);

a synthesizing section (fig. 1, item 408) for synthesizing respective image data of said first area and said second area corrected by said correcting section ("[t]he combined picture is displayed by the indicator 408" at ¶ 0015), and

an image data collecting section (fig. 1, item 406) for executing said scan by using a pulse sequence constructed by a pulse series in a pulse series of one of a multi-shot type and a single type is arranged (¶¶ 0016,0017,0020),

Takizawa does not disclose wherein the pulse sequence is constructed by a pulse series based on one of a spin warp method, a spiral method and a radial method.

Edelstein teaches a spin warp NMR imaging that includes wherein the pulse sequence is constructed by a pulse series based on one of a spin warp method (fig. 1), a spiral method and a radial method

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the pulse sequence constructed by the pulse series of Takizawa to be based on one of a spin warp method, a spiral method and a radial method as taught by Edelstein to "display more interesting detail than do the proton density ones". In addition, to "to acquire NMR signals and reconstruct images use a variant of the well known Fourier transform (FT) imaging technique. . . .". *Mistretta et al.*, U.S. Pat. No. 6,188,922, at 1:45-67 ("Mistretta")

Regarding **Claim 2**, Takizawa discloses wherein said correcting section (fig. 1, item 407) is constructed so as to perform linear correction processing according to a spatially ununiform

deteriorating degree (¶¶ 0029-0030) of said image data (fig. 1, item 405; fig. 8) generated by the movement (e.g., fig. 8, spatial distribution items 1011, 1021, 1022)) of said image pickup part (fig. 1, item 405; fig. 8).

Regarding **Claim 3**, Takizawa discloses wherein said synthesizing section (fig. 1, item 408) is constructed so as to synthesize ("[t]he combined picture is displayed by the indicator 408" at ¶ 0015) the image data (fig. 1, item 405; fig. 8) after a first correction in said first area (fig. 8, bottom-right inner circle within item 1011), and the image data after a second correction different from said first correction in said second area (fig. 8, top-right inner circle within item 1011).

Regarding **Claim 4**, Takizawa discloses wherein said synthesizing section (fig. 1, item 408) is constructed so as to synthesize the image data (fig. 1, item 405; fig. 8) after the correction in said first area (fig. 8, bottom-right inner circle within item 1011), and uncorrected image data in said second area (fig. 8, top-right inner circle within item 1011).

Regarding **Claim 5**, Takizawa discloses wherein said movement information acquiring section (fig. 1, item 406) has a navigator echo collecting section (fig. 4, item 601) for collecting an echo signal (e.g., fig. 3, item 303) for a navigator when data for imaging are collected from said image pickup part (fig. 1, item 405; fig. 8), and also has a movement information generating section (fig. 2, item 407) for processing said echo signal and generating said movement information ("[t]he signal which each small RF coil of multiple coils received is detected" at ¶ 0014).

Regarding **Claim 7**, Takizawa discloses wherein said correcting section (fig. 1, item 407) is constructed so as to respectively make different corrections with respect to three areas or more (fig. 8, items 1021-1023) of said image data (fig. 8).

Regarding **Claim 9**, Takizawa discloses wherein said movement information acquiring section (fig. 1, item 406) has:

a navigator echo collecting section (fig. 4, item 601) for collecting an echo signal (e.g., fig. 3, item 303) for a navigator in one of a data read-out direction ("position change" at ¶ 0026) and a phase encode direction ("phase changes" at ¶ 0026) caused by the imaging when data for imaging are collected from said image pickup part (fig. 1, item 405; fig. 8);

a projection data generating section (fig. 1, item 407) for processing said echo signal (e.g., fig. 3, item 303) and generating projection data ("body motion amendment" at ¶ 0024); and

a movement information generating section (fig. 1, item 407) for using said projection data as said movement information (fig. 8, items 1021-1023).

Regarding **Claim 10**, Takizawa wherein said movement information acquiring section has:

a navigator echo collecting section (fig. 1, item 406) for collecting an echo signal ("the phase of a navigation echo" at ¶ 0004) for a navigator when data for imaging are collected from said image pickup part; and

a movement information generating section (fig. 1, item 406) for calculating a shift of one of a phase distribution of a k-space of said echo signal ("the phase shift of the navigation echo" at ¶ 0021) and a position of at least one direction of an r-space as said movement information ("the amount of phase changes is similarly calculated by correction from a position change. . ." at ¶ 0026).

Regarding **Claim 11**, Takizawa discloses wherein an image data collecting section (fig. 1, item 405; fig. 2, item 601) for collecting said image data (e.g., fig. 8) by using a single signal receiving RF coil is arranged ("an MRI device provided with a receiver coil which receives an NMR signal" at ¶ 0007; "RF coil" at ¶0013).

Regarding **Claim 12**, Takizawa discloses wherein said correcting section (fig. 1, item 407) is constructed so as to substantially generate plural image data (i.e., the image data of each coil) by multiplying said image data (e.g., fig. 8) in said image pickup part (fig. 1, item 406) by plural window functions having weight distributions different from each other (¶0029-0030).

Regarding **Claim 13**, Takizawa discloses wherein said correcting section (fig. 1, item 407) is constructed so as to perform linear correction processing (¶¶ 0033-0034 with respect to position, amplitude and phase) with respect to one of a position shift ("position change" at ¶ 0026) due to said movement (e.g., fig. 8, items 1021-1023) of said respective image data (fig. 8) in said first area (fig. 8, bottom-right inner circle within item 1011) and said second area (fig. 8, top-right inner circle within item 1011), and a phase shift ("phase changes" at ¶ 0026) within a voxel.

Regarding **Claim 14**, Takizawa discloses wherein said correcting section (fig. 1, item 407) is constructed so as to perform linear correction processing (¶0033) shown by one of a mean shift as a zeroth order of one of the phase and the position ("position change" and "phase changes" at ¶ 0026, both changes being the mean shift as a zeroth order), and affine transformation (e.g., "Fourier transform" at ¶ 0023).

Regarding **Claim 16**, Takizawa discloses wherein said movement information acquiring section (fig. 1, item 406) is constructed so as to acquire the movement information ("[t]he signal which each small RF coil of multiple coils received is detected" at ¶ 0014) showing a three-dimensional spatial distribution ("navigation echo of slice encode directions of three-dimensional imaging" at ¶ 0035), and said correcting section (fig. 1, item 407) is constructed so as to three-dimensionally make the correction on the basis of the movement information showing said three-dimensional spatial distribution ("this invention may be applied to a FSE sequence of an EPI sequence" at ¶ 0035 which includes movement correction).

Regarding **Claim 17**, Takizawa discloses wherein said information acquiring section (fig. 1, item 406) is constructed so as to acquire the movement information (fig. 8, items 1021-1023) showing a spatial distribution of the magnitude of the movement of a non-rigid body (fig. 8, item 1011).

Regarding **Claim 18**, Takizawa discloses wherein said movement information acquiring section (fig. 1, item 406)) is constructed so as to use the spatial distribution (e.g., fig. 8, spatial distribution items 1011, 1021, 1022) of the magnitude of a movement supposed in advance in said image pickup part (fig. 1, item 405).

Regarding **Claim 20**, Takizawa discloses wherein an image data collecting section (fig. 1, item 405; fig. 2, item 601) for collecting said image data (e.g., fig. 8) by providing a sensitivity distribution (e.g., fig. 8, items 1021-1023) according to the magnitude of the movement of said image pickup part (fig. 1, item 405) in advance is arranged.

Regarding **Claim 24**, Takizawa discloses wherein said image data collecting section (fig. 1, item 405; fig. 2, item 601) is constructed so as to collect said image data by using the multi-coil having plural element coils of sensitivity distributions different from each other ("multiple coils 1000 which consist of two or more receiver coils" at ¶ 0005; fig. 4, item 602).

Regarding **Claim 27**, Takizawa discloses wherein said correcting section is constructed so as to substantially generate plural image data (e.g., "slice encode directions of three-dimensional imaging" at ¶ 0035) by multiplying one portion or all portions of the plural image data collected by using said plural element coils by plural window functions (equation 1 of ¶ 0030) having weight distributions ("each small RF coil by carring out weighting by the sensitivity distribution of the small RF coil" at ¶ 0029) different from each other.

Regarding **Claim 28**, Takizawa discloses an image data correcting device (fig. 1) comprising:

a correcting section (fig. 1, item 407) for making a correction different (fig. 8, items 1022 and 1023 are different) from that of a second area (fig. 8, top-right inner circle within item 1011) in a first area (fig. 8, bottom-right inner circle within item 1011) of image data of an image pickup part (fig. 1, item 405; fig. 8) of said detected body (fig. 8, item 1011 and the four smaller circles contained within item 1011) collected by a scan of magnetic resonance imaging (fig. 1) on the basis of said movement information ("signal processing part 407 has the body motion compensation means using the navigation echo" at ¶ 0015) showing a spatial distribution (e.g., fig. 8 shows a spatial distribution) of the magnitude of a movement in the real space of said image pickup part (fig. 1, item 405; fig. 8); and

a synthesizing section (fig. 1, item 408) for synthesizing respective image data of said first area and said second area corrected by said correcting section ("[t]he combined picture is displayed by the indicator 408" at ¶ 0015), and

an image data collecting section (fig. 1, item 406) for executing said scan by using a pulse sequence constructed by a pulse series in a pulse series of one of a multi-shot type and a single type is arranged (¶¶ 0016,0017,0020),

Takizawa does not disclose wherein the pulse sequence is constructed by a pulse series based on one of a spin warp method, a spiral method and a radial method.

Edelstein teaches a spin warp NMR imaging that includes wherein the pulse sequence is constructed by a pulse series based on one of a spin warp method (fig. 1), a spiral method and a radial method

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the pulse sequence constructed by the pulse series of Takizawa to be based on one

of a spin warp method, a spiral method and a radial method as taught by Edelstein to "display more interesting detail than do the proton density ones". In addition, to "to acquire NMR signals and reconstruct images use a variant of the well known Fourier transform (FT) imaging technique. . . .". Mistretta at 1:45-67.

Regarding **Claim 29**, Takizawa discloses identical features from the correcting section as recited in Claim 2. Thus, references/arguments equivalent to those presented above for Claim 2 are equally applicable to Claim 29.

Regarding **Claim 37**, Takahashi discloses a method to perform the image data correcting device (fig. 1) as recited in Claim 1. Thus, references/arguments equivalent to those presented above for Claim 1 are equally applicable to Claim 37.

Regarding **Claim 38**, Takahashi discloses a method to perform the image data correcting device (fig. 1) as recited in Claim 28. Thus, references/arguments equivalent to those presented above for Claim 28 are equally applicable to Claim 38.

Regarding **Claim 41**, Takahashi discloses a magnetic resonance imaging device (fig. 1) comprising:

a movement information acquiring section (fig. 1, item 406) for acquiring movement information ("[t]he signal which each small RF coil of multiple coils received is detected" at ¶ 0014) showing a spatial distribution (e.g., fig. 8, spatial distribution items 1011, 1021, 1022) of the magnitude of a movement in the real space of an image pickup part (fig. 1, item 405; fig. 8) of a detected body (fig. 8, item 1011 and the four smaller circles contained within item 1011);

an image data collecting section (fig. 1, item 406) for collecting image data of the image pickup part of said detected body (fig. 1, item 401) by a scan of magnetic resonance imaging ("MIR device" at ¶ 0011);

a correcting section (fig. 1, item 407) for making a correction different (fig. 8, items 1022 and 1023 are different) from that of a second area (fig. 8, top-right inner circle within item 1011) in a first area (fig. 8, bottom-right inner circle within item 1011) of image data on the basis of said movement information ("signal processing part 407 has the body motion compensation means using the navigation echo" at ¶ 0015); and

a synthesizing section (fig. 1, item 408) for synthesizing respective image data of said first area and said second area corrected by said correcting section ("[t]he combined picture is displayed by the indicator 408" at ¶ 0015) , and

an image data collecting section (fig. 1, item 406) for executing said scan by using a pulse sequence constructed by a pulse series in a pulse series of one of a multi-shot type and a single type is arranged (¶¶ 0016,0017,0020),

Takizawa does not disclose wherein the pulse sequence is constructed by a pulse series based on one of a spin warp method, a spiral method and a radial method.

Edelstein teaches a spin warp NMR imaging that includes wherein the pulse sequence is constructed by a pulse series based on one of a spin warp method (fig. 1), a spiral method and a radial method

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the pulse sequence constructed by the pulse series of Takizawa to be based on one of a spin warp method, a spiral method and a radial method as taught by Edelstein to "display more interesting detail than do the proton density ones". In addition, to "to acquire NMR signals and reconstruct images use a variant of the well known Fourier transform (FT) imaging technique. . . .". Mistretta at 1:45-67.

Regarding **Claim 42**, Takahashi discloses an image data correcting device comprising:

an image data collecting section (fig. 1, item 406) for collecting image data (e.g., fig. 8 slices) of the image pickup part of said detected body (fig. 1, item 401) by a scan of magnetic resonance imaging ("MIR device" at ¶ 0011);

a correcting section (fig. 1, item 407) for making a correction different (fig. 8, items 1022 and 1023 are different) from that of a second area (fig. 8, top-right inner circle within item 1011) in a first area (fig. 8, bottom-right inner circle within item 1011) of said collected image data (fig. 8 slices) on the basis of movement information ("[t]he signal which each small RF coil of multiple coils received is detected" at ¶ 0014) showing a spatial distribution (e.g., fig. 8, spatial distribution items 1011, 1021, 1022) of the magnitude of a movement in the real space of said image pickup part (fig. 1, item 405); and

a synthesizing section (fig. 1, item 408) for synthesizing respective image data of said first area and said second area corrected by said correcting section ("[t]he combined picture is displayed by the indicator 408" at ¶ 0015), and

an image data collecting section (fig. 1, item 406) for executing said scan by using a pulse sequence constructed by a pulse series in a pulse series of one of a multi-shot type and a single type is arranged (¶¶ 0016,0017,0020),

Takizawa does not disclose wherein the pulse sequence is constructed by a pulse series based on one of a spin warp method, a spiral method and a radial method.

Edelstein teaches a spin warp NMR imaging that includes wherein the pulse sequence is constructed by a pulse series based on one of a spin warp method (fig. 1), a spiral method and a radial method

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the pulse sequence constructed by the pulse series of Takizawa to be based on one of a spin warp method, a spiral method and a radial method as taught by Edelstein to "display more interesting detail than do the proton density ones". In addition, to "to acquire NMR signals and reconstruct images use a variant of the well known Fourier transform (FT) imaging technique. . . .". Mistretta at 1:45-67.

Takizawa in view of Edelstein, and in further view of Kretschmer

[14] **Claim 6** is rejected under § 103(a) as being unpatentable over Takizawa in view of Edelstein, and in further view of *Kretschmer et al.*, U.S. Pat. No. 4,945,916 ("Kretschmer").

Regarding **Claim 6**, Takizawa in view of Edelstein does not disclose wherein said movement information acquiring section has: a sensor for detecting the movement of said image pickup part from the exterior optically or by air pressure; and a movement information generating section for processing a signal detected by said sensor and generating said movement information.

Kretschmer teaches an optical device for the simultaneous detection of heart and respiratory movements (fig. 3) that includes wherein a movement information acquiring section (fig. 3) has:

a sensor ("electro-optical means" at 1:40-47[8]) for detecting the movement of said image pickup part from the exterior optically (fig. 1, item 5) or by air pressure ("air pressure on either side of the diaphragm" at 3:29-35); and

a movement information generating section (fig. 4 creating figs. 6, 7) for processing a signal detected by said sensor (input into fig. 4) and generating movement information ("cardiac and respiratory movements" at 1:8-14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the movement information acquiring section of Takizawa in view of Edelstein to include a sensor for detecting the movement of said image pickup part from the exterior optically or by air pressure; and a movement information generating section for processing a signal detected by said sensor and generating said movement information as taught by Kretschmer "for the simultaneous detection of cardiac and respiratory movements" and "for synchronizing nuclear magnetic resonance imaging instruments". Kretschmer at 1:8-14.

Allowable Subject Matter

[15] **Claims 8, 21, 25** and **26** would be allowable if rewritten (i) to overcome the rejection(s) under 35 U.S.C. §§ 101, 112, 2nd paragraph; and (ii) in independent form including all of the limitations of the base claim and any intervening claims to overcome the objection to as being dependent upon a rejected base claim.

[16] **Claims 19, 22** and **23** would be allowable if rewritten (i) to overcome the rejection(s) under 35 U.S.C. § 101; and (ii) in independent form including all of the limitations of the base claim and any intervening claims to overcome the objection to as being dependent upon a rejected base claim.

Reasons for Indicating Allowable Subject Matter

[17] The following is a statement of reasons for the indication of allowable subject matter:

Regarding Claim 8, the prior art of record does not teach obtaining processing information including average values of the amplitude and phase of the movement of each part

[8] "1:40-47" short notation for "Col. 1, lines 40-47".

and generating said movement information on the basis of said profile and said processing information.

Regarding Claim 19, the prior art of record does not teach including a non-correction with respect to two areas or more obtained by mutually synthesizing one portion of at least three areas or more in said image data of said image pickup part. Claims 22-23 would be allowable by dependency.

Regarding Claim 21, the prior art of record does not teach constructing such that a distribution substantially linearly increased from the back side of said abdominal part to said abdominal wall side.

Regarding Claim 25, the prior art of record does not teach two surface coils respectively arranged on the back side and the abdominal wall side as said plural element coils. Claim 26 allowable by analogy.

Conclusion

Citation of Pertinent Prior Art

[18] The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 6,188,922 A.

[19] Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID P. RASHID whose telephone number is (571)270-1578 and fax number (571)270-2578. The examiner can normally be reached Monday - Friday 7:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-74537453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

David P Rashid
Examiner
Art Unit 26244